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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: INSECT ATTRACTING DEVICE

## (57) Abstract

Apparatus for attracting insects which includes insect trapping means, a body containing at least one evaporatable insect attractive compound for sustained release therefrom, and heating means arranged for heating the body when the latter is in or near said trapping means.

Insect Attracting Device

5 The present invention is concerned with a device for attracting insects and the like.

10 As the world's population grows, much attention has been paid to methods of increasing the food supply. One element in such methods is the prevention of post-harvest losses resulting from the activities of insects and other pests during storage of foodstuffs. In addition to rendering the food unavailable in times of shortage, the activities of such pests result in economic loss associated with the presence of contaminants such as live and dead insects.

15 The traditional technique for control of pests (such as houseflies or the like) has been by the application of insecticides. Such insecticides are typically in the form of residual treatment and space sprays. The housefly (like other insects) has, however, developed high levels of resistance to many of the major groups of insecticides. Alternative means of control are therefore being sought.

20 In order for an insect control to be effective, it needs to rely on non-chemical means or on strategies which incorporate limited insecticide use and minimise the selection for resistance.

25 It is known to provide traps for the monitoring, study and control of flying insects. Such traps are of various designs and may be, for example, tent-shaped, plain strips

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preferred such compound is a pheromone. When the insect is the common housefly, such a pheromone preferably comprises Z-9-tricosene.

5 The heating means is preferably arranged to be set at a temperature of about 70 degrees Celsius. For example, the heating means is preferably provided with a thermostat arranged to ensure that the heating means is maintained within five degrees Celsius of a predetermined temperature  
10 (such as about 70 degrees Celsius).

The heating means is preferably arranged to be electrically heated, and may, for example, be mains power operated or battery operated. Such heating means preferably comprise  
15 a heating element provided in or on an opaque thermally resistant matrix, and means for connecting said heating element to a power supply. However, when the apparatus is to be used in the field, it is preferred that the power supply is an electrical battery.

20 The sustained release formulation is preferably positioned in close proximity to the heating means so as to enhance evaporative release of the at least one attractant.

25 The trapping means may be for example, tent-shaped, plain strips of card or the like, or a closed tub having at its upper end a funnel shaped entrance area which permits entry of one or more insects into the tub but prevents the escape of insects therefrom. Examples of suitable such trapping  
30 means are described in GB-A-2052942; other suitable trapping means are described in US-A-5170583.

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following Examples.

Referring to Figure 1, there is shown an insect trap generally designated 1, the trap having an insect-receiving tub 2 with a liner 3 of sticky sheet material. Covering the open end 4 of tub 2 is a removable funnel 5. The funnel includes a skirt portion 6 which is removably attached to the tub by a screw thread (not shown) or the like, an upwardly extending curved portion 7, and a downwardly extending constricted tubular portion 8 for which the narrow end 9 extends into the interior of the tub 2. Mounted to the curved portion are a series of legs 10 which support a concave cover 11, having on an upper face, a series of hanging lugs 12.

To the underside of cover 11 is secured a battery operable heater 13, and adjacent thereto, a lure pad containing a sustained release material for release of an insect-attractive compound as indicated above. Also secured to the underside of cover 11 is a light sensor (see Figure 2).

In use, the heater 13 is activated and thermostatically controlled to permit sustained release of insect attractant from the insect-attractive compound.

The invention may be more clearly understood from the following illustrative examples, in which reference is made to Figure 3 of the accompanying drawing:

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	Trap 1	Trap 2	Trap 3	Trap 4
Day 1	5	47	500+	135
Day 2	1	52	94	57
5 Day 3	18	232	395	676
Day 4	31	267	780	880
Day 5	40	46	175	432

10 It can be seen from the results that the traps which had  
heated pads caught significantly more flies than the traps  
which did not have heated pads. In addition, it can be  
seen that more flies were trapped if a heated pad was in  
the lid of the funnel, presumably because in this location  
15 the pheromone is allowed to circulate more freely.

#### Example 2: Laboratory Trials

20 The laboratory trials took place in a controllable  
environment. The test chambers were large enough to  
accommodate four funnel traps; the arrangement of the traps  
being illustrated in Figure 3. The traps were suspended  
from two lines running across the room at approximately 1.8  
25 metres above the floor.

Houseflies were supplied as pupae and were kept in a mesh  
cage until emergence. A new group of flies were released  
into the room and allowed to fly freely for the duration of  
30 each test. After this time, the number of flies caught in  
each trap was counted.

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## Day 8

Trap	Parameter	Count	Trap	Parameter	Count
FL	H	9	FR	HL	122
NL	HL	88	NR	H	35

5

## Day 9

Trap	Parameter	Count	Trap	Parameter	Count
FL	P	3	FR	Blank	2
NL	Blank	0	NR	P	9

10

## Day 10

Trap	Parameter	Count	Trap	Parameter	Count
FL	PL	29	FR	Blank	2
NL	Blank	0	NR	PL	51

15

## Day 11

Trap	Parameter	Count	Trap	Parameter	Count
FL	Blank	7	FR	PL	94
NL	PL	66	NR	Blank	1

20

25 The presence of light and pheromone-releasing body resulted in increased trap catch. Traps with pheromone-releasing body plus light caught almost 100% of the flies in the room.

The first two tests (day 6) show that with no light in the room, and no pheromone either, the catches in all of the

30



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## Day 14

Trap	Parameter	Count	Trap	Parameter	Count
FL	P	1	FR	PH	11
NL	PH	9	NR	P	2

With no light in room the trap catch is very low, but the heated pheromone still attracted more flies than the unheated lures.

The light was switched back on for a repeat of day 13 test

## Day 15

Trap	Parameter	Count	Trap	Parameter	Count
FL	PH	10	FR	P	13
NL	P	3	NR	PH	24

A pheromone pad was present in every trap. In the first two tests, the traps with heated pheromone caught significantly more flies than the traps without heat. On day 12, the pheromone and heat traps caught 61% of the total catch and on day 13, they caught 80%.

The room light was switched off for day 14 and the results show that the catch dropped dramatically, confirming the need for light before the flies respond to other factors. In dark conditions, however, the data shows that 90% of flies are caught in the traps where the pheromone was heated.

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8. Apparatus according to claim 7, wherein the temperature range is from about 65°C to 75°C.
- 5 9. Apparatus according to any of claims 1 to 8, wherein the heating means is arranged to be electrically heated.
- 10 10. Apparatus according to claim 9, wherein the heating means is provided with mains power or battery electrical supply.
- 15 11. Apparatus according to any of claims 1 to 10, wherein said heating means comprises a heating element provided in or on an opaque thermally resistant matrix, and means for connecting the heating element to a power supply.
- 20 12. Apparatus according to any of claims 1 to 11, wherein the insect attractive compound is in close proximity to the heating means.
- 25 13. Apparatus according to any of claims 1 to 12, wherein the trapping means is tent shaped, plain strips of card or the like.
- 30 14. Apparatus according to any of claims 1 to 12, wherein the trapping means is a closed tub having a funnel shaped entrance at an upper end which permits entry of one or more insects into the tub but substantially prevents the escape of insects therefrom.

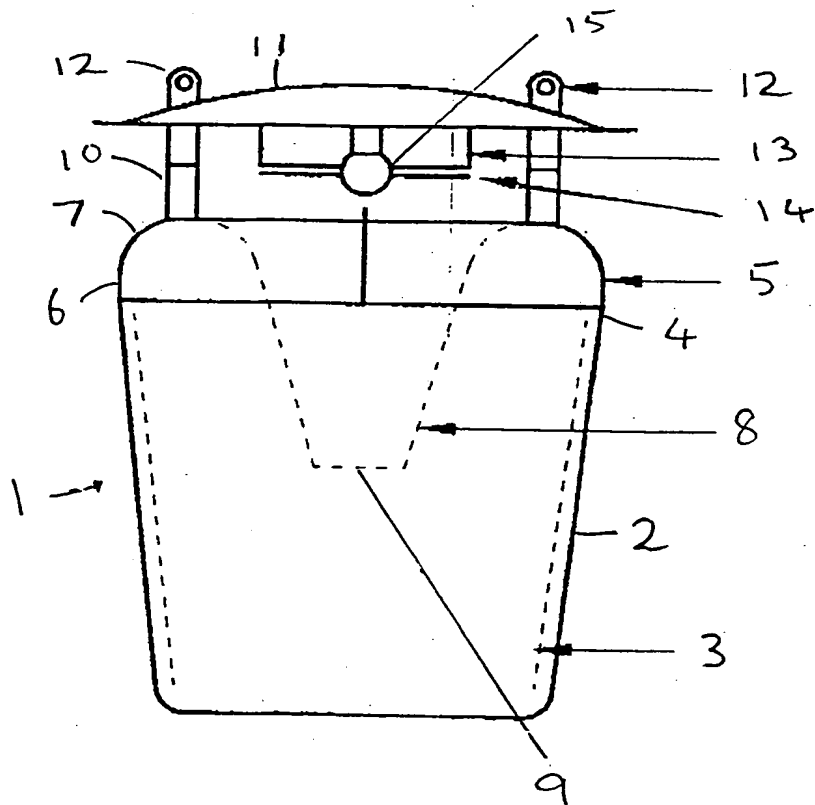


FIGURE 1

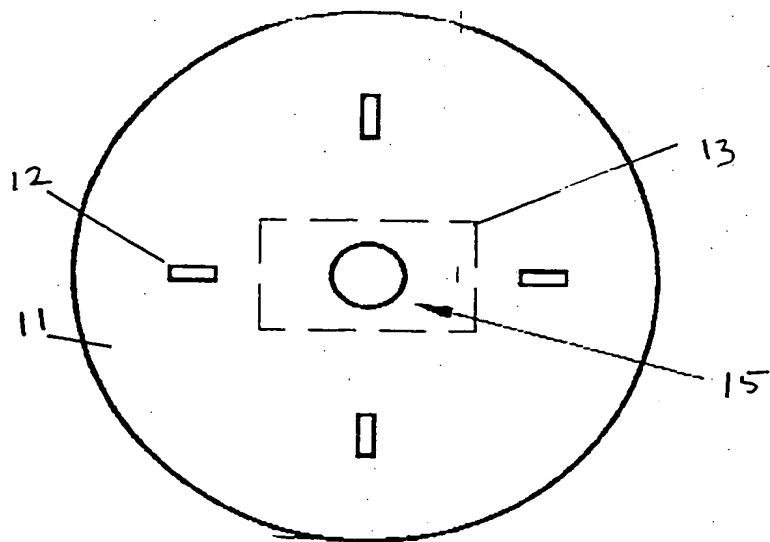


FIGURE 2

# INTERNATIONAL SEARCH REPORT

Inte onal Application No  
PCT/GB 99/01137

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 A01M1/02 A01M1/10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 283 878 A (HILL ALISTAIR C ET AL) 18 August 1981 (1981-08-18)	1-6,9, 10,12, 14,15,18 11
A	column 1, line 15 - column 2, line 65 column 3, line 13 - line 63 column 4, line 16 - line 62 claims; figures	
X	US 5 184 417 A (WELDON CHERYL D) 9 February 1993 (1993-02-09)	1,9,10, 12,15, 17,18
	column 1, line 31 - column 2, line 16 claims; figures	
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

**\* Special categories of cited documents :**

- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "&" document member of the same patent family

Date of the actual completion of the international search

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4283878 A	18-08-1981	NONE	
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GB 2052942 A	04-02-1981	NONE	
US 5170583 A	15-12-1992	AU 651614 B	28-07-1994
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		DE 69102845 D	18-08-1994
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		JP 4248947 A	04-09-1992

